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Conduct Disorder and Antisocial Personality Disorder in Persons With Severe Psychiatric and Substance Use Disorders

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Conduct disorder (CD) and antisocial personality disorder (ASPD) are established risk factors for substance use disorders in both the general population and among persons with schizophrenia and other severe mental illnesses. Among clients with substance use disorders in the general population, CD and ASPD are associated with more severe problems and criminal justice involvement, but little research has examined their correlates in clients with dual disorders. To address this question, we compared the demographic, substance abuse, clinical, homelessness, sexual risk, and criminal justice characteristics of 178 dual disorder clients living in 2 urban areas between 4 groups: No CD/ASPD, CD Only, Adult ASPD Only, and Full ASPD. Clients in the Adult ASPD Only group tended to have the most severe drug abuse severity, the most extensive homelessness, and the most lifetime sexual partners, followed by the Full ASPD group, compared with the other 2 groups. However, clients with Full ASPD had the most criminal justice involvement, especially with respect to violent charges and convictions. The results suggest that a late-onset ASPD subtype may develop in clients with severe mental illness secondary to substance abuse, but that much criminal behavior in clients with dual disorders may be due to the early onset of the full ASPD syndrome in this population and not the effects of substance use disorders.

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Abundant evidence shows that having a psychiatric illness increases vulnerability to a comorbid substance use disorder, with the highest risk associated with antisocial personality disorder (ASPD) and its developmental precursor, conduct disorder (CD).[1,2] Furthermore, among individuals with alcohol or drug use disorder, ASPD is associated with a more severe course of addiction, including an earlier onset, more rapid progression to dependence, and greater social, legal, and physical consequences of use.[3–7] Indeed, the importance of ASPD in substance abuse is reflected by the fact that similar features of this disorder have been prominent in the 3 major subtypes of addiction proposed over the past several decades, including the Type I/II[8] and Type A/B[9] subtypes, and to a lesser extent the delta/gamma subtype.[10]

Less research has evaluated the relationships between ASPD, CD, and substance abuse in persons with severe mental illnesses such as schizophrenia. Understanding these relationships is of theoretical and clinical interest because schizophrenia is associated with increased rates of CD or similar behavioral disturbances in childhood[11–14] and ASPD in adulthood,[13,15–17] as well as substance use disorders.[2,18,19] Determining whether ASPD is associated with an increased prevalence and severity of substance abuse could shed light on the high rate of substance use disorders in severe mental illness (ie, ''dual disorders''). For example, we have hypothesized that the high rate of dual disorders may be partly explained by ASPD acting as a ''third variable'' that independently increases risk for both mental illness and substance use disorders.[20]

Growing evidence indicates that, similar to the general population, CD and ASPD are associated with an increased rate of substance use disorders and criminality in persons with schizophrenia and other severe mental illnesses.[21–25] Less research has evaluated the associations between CD, ASPD, and substance abuse among persons with dual disorders. A better understanding of these relationships could have implications for the validity of a subtype of addiction based on ASPD. In one study of

persons with schizophrenia and substance use disorders, we reported that CD and ASPD were associated with greater substance abuse severity, including an earlier age of onset of substance abuse, more severe substance abuse symptoms, and a stronger family history of substance abuse, as well as more severe psychiatric symptoms and aggression.[26,27] This study took place at primarily rural community mental health center settings in New Hampshire, which served predominantly white clients with alcohol use disorders. There is a need to examine these associations in more ethnically diverse populations living in more urban areas.

In addition, research examining the relationships between severe mental illness, substance use disorders, ASPD, and criminality could have important implications for risk management in outpatient treatment settings. Both ASPD and psychopathy are important factors included in the Historical Clinical Risk-20 (HCR-20), a well-validated and internationally used violence risk assessment instrument for the offender population,[28,29] and our research has shown that ASPD is prospectively predictive of criminal justice system involvement in clients with dual disorders living in rural areas.[30] Evaluating the relationship between ASPD and criminality in clients with dual disorders could be informative in determining which clients are at greatest risk for violence and criminal behavior. The present study reports on the relationships between CD, ASPD, substance abuse, psychiatric symptom severity, and criminal justice involvement in a predominantly minority sample of clients with disorders living in urban areas. Based on our prior research, we hypothesized that the presence of CD and the full ASPD syndrome would be associated with more severe substance use problems, greater clinical and functional impairments, and more involvement in the criminal justice system, compared with clients with dual disorders alone.

Method

The study sample was drawn from the baseline assessment of a randomized controlled trial comparing the effects of integrated treatment for dual disorders delivered by either assertive community treatment or standard case management in persons with severe mental illness.[31] The study was carried out at 2 state-funded mental health centers in different cities in Connecticut that serve primarily minority clients.

Participants

Eligibility criteria included (1) presence of a major psychotic disorder (schizophrenia, schizoaffective disorder, bipolar disorder, or major depression with psychotic features); (2) active substance use disorder (abuse or dependence of alcohol and/or drugs within the past 6 months); (3) high service use in past 2 years, including 2 or more psychiatric hospitalizations, stays in a psychiatric crisis or respite program, emergency room visits, or incarcerations; (4) homelessness or unstable housing; (5) poor independent living skills; (6) absence of pending legal charges, medical conditions, or mental retardation that would preclude participation; (7) for inpatients, scheduled for discharge to community living; and (8) willingness to provide written informed consent.

Of 382 clients referred by their clinicians, 244 met screening criteria and were assessed as eligible, 215 consented to join the study, and 205 completed the baseline interview and were randomly assigned within sites to treatment teams. For different reasons (early transfers to forensic teams, re-diagnoses, moves out of state, and 1 refusal to accept treatment assignment), 7 of these clients were administratively dropped from the study. Among the 198 who were in the study, 178 had complete data on CD and ASPD and are included in the present report. Clients were enrolled in the study between 1993 and 1996.

Of the178 clients 125 (70.2%) were male, 48 (27%) were white, and 100 (56.2%) were African American; 48 (27%) had ever married, 88 (49.4%) had graduated high school, and 37 (20.8%) were currently working; and 99 (55.6%) had schizophrenia, 41 (23%) had schizoaffective disorder, and 30 (16.9%) had bipolar disorder. The average age of the clients was 36.8 (SD = 7.7) years, and over the past year these clients had spent an average of 16.2 (SD = 32.1) days in a psychiatric hospital, 2.4 (SD = 6.9) days in substance abuse treatment facilities, and 21.8 (SD = 56.3) days of literal homelessness.

Measures

Research interviewers were clinicians who were trained via videotapes and paired with seasoned interviewers before working independently. Ongoing supervision included review of audiotaped interviews and training conferences. Research clinicians established diagnoses of co-occurring severe mental and substance use disorders using the Structured Clinical Interview for DSM-III-R.[32] As the criteria for CD and ASPD changed markedly from DSM-III-R to DSM-IV, which became available soon after the beginning of the study, the SCID-II[33] was used to assess these disorders. In addition, in order to evaluate whether an antisocial lifestyle in adulthood was related to substance use problems, the adult ASPD items were rated for all clients, irrespective of whether they met criteria for childhood conduct disorder.

At the baseline interview items from the Uniform Client Data Inventory[34] were used to assess demographic information. Psychiatric symptoms over the past 2 weeks were assessed with the Expanded Brief Psychiatric Rating Scale (BPRS),[35] with analyses conducted on the following

subscales: anergia, thought disorder, activation, affect, and disorganization. Overall functioning was evaluated with the Global Assessment Scale (GAS).[36] Detailed chronological assessment of housing history and institutional stays was assessed using a self-report calendar, supplemented by outpatient records and hospital records for the year prior to baseline.

Substance abuse severity was assessed using a variety of measures. The number of days over the past 6 months of drinking to intoxication and days of drug use were measured with the Timeline Follow-Back (TLFB).[37] The medical, legal, and substance use sections from the Addiction Severity Index (ASI) were administered, as well as the global rating of alcohol and drug use severity provided by the interviewer.[38] To increase the validity of self-reported substance use, we supplemented interview data with laboratory measures and clinician ratings. At the time of the interview, we conducted urine toxicology screens to assess drugs of abuse and saliva swabs to detect alcohol. Case managers rated clients' substance use over the past 6 months on 3 rating scales: the Alcohol Use Scale (AUS), the Drug Use Scale (DUS), and the Substance Abuse Treatment Scale (SATS). The AUS and DUS are 5-point scales based on DSM-III-R criteria for severity of substance use disorder: 1 = abstinence, 2 = use without impairment, 3 = abuse, 4 = dependence, and 5 = severe dependence.[39,40] The Substance Abuse Treatment Scale is an 8-point scale that indicates progressive movement toward treatment involvement, remission, and recovery from substance use disorders.[40,41] Independent raters blind to psychiatric and ASPD/CD diagnoses considered all available data on substance use to establish consensus ratings on all 3 scales, with good demonstrated reliability.[42] For this article we analyzed data based on the TLFB, the ASI interviewer severity ratings for alcohol and drugs, and reviewers' consensus ratings of the AUS, DUS, and SATS.

We also assessed behaviors that increase risk for infectious diseases with the AIDS Risk Inventory.[43] This instrument includes 34 questions pertaining to high-risk drug use and sexual behaviors. Because of the low rate of injection drug use in the sample, only data from the sexual risk questions are reported here, including number of lifetime sexual partners, lifetime sexual risk, and sexual risk for the past 30 days.

Procedures

Following an institutional review board–approved protocol, case managers identified and referred clients who had co-occurring mental health and substance use disorders and who met the study eligibility criteria. After providing written informed consent for the study, participants completed the baseline assessments. Participants were paid for completing the baseline interview and providing urine and saliva samples.

Statistical Analyses

We conducted comparisons of 4 groups of clients based on the CD and ASPD assessments from the SCID-II: No CD/ASPD, CD Only, Adult ASPD Only, and Full ASPD. These groups were compared on demographic, diagnostic, clinical, substance abuse, and legal measures. Categorical variables were evaluated using chi-square analyses. Continuous variables were analyzed using either 1-way analyses of variance (ANOVA) or (if data were skewed) Kruskal-Wallis chi-square tests. Analyses of alcohol use severity (eg, TLFB Alcohol, AUS) were conducted on the subgroup of clients who met diagnostic criteria on the SCID for an alcohol use disorder (abuse or dependence), and similarly, analyses of drug use severity were conducted on those clients with a drug use disorder on the SCID. We report both conventional probability levels, as well as those meeting the $p < .05$ Bonferroni bounds correction for multiple tests, computed separately for domain (background characteristics, diagnoses, substance abuse severity, criminal justice involvement, symptoms and functioning, and risky behaviors).

Results

Based on SCID-II criteria, 38 clients (21.3%) had Full ASPD, 15 (8.4%) had CD Only, 33 (18.5%) had Adult ASPD Only, and 92 (51.7%) had No CD/ASPD.

Demographic and Background Characteristics

Differences between the 4 CD/ASPD groups in demographic and background variables are summarized in Tables 1 and 2. The Full ASPD group had a higher percentage of men (89.5%) than the other groups (60.6–73.3%), whereas the Adult ASPD Only had a higher percentage of women (39.4%) than the other groups (26.7–34.8%). Clients with CD Only were least likely to have graduated high school (13.3%), followed by clients with Full ASPD (42.1%), clients with no CD/ASPD (54.3%), and then clients with Adult ASPD Only (60.6%). Clients in both of the ASPD groups were more likely to have been recently homeless (62.5% for Adult ASPD Only and 42.1% for Full ASPD) than clients with No CD/ASPD (34.8%) or CD Only (20%). This difference in homelessness was partially reflected in the number of days over the past year of literal homelessness, in which the CD Only group had fewer days (5.73) than the other 3 groups (range: 20.55–29.72 days).

Psychiatric and Substance Use Functioning

Differences between the 4 CD/ASPD groups in psychiatric and substance use diagnoses and substance abuse

Table 1. Demographic and Background Characteristics: Categorical Variables

Categorical Variables	No CD/ASPD (N = 92) n (%)	CD Only (N = 15) n (%)	Adult ASPD Only (N = 33) n (%)	Full ASPD (N = 38) n (%)	χ^2 Test
Gender					
Male	60 (65.2)	11 (73.3)	20 (60.6)	34 (89.5)	9.37*
Female	32 (34.8)	4 (26.7)	13 (39.4)	4 (10.5)	
Race					
White	24 (26.1)	5 (33.3)	9 (27.3)	10 (26.3)	0.35
Nonwhite	68 (73.9)	10 (66.7)	24 (72.7)	28 (73.7)	
Marital Status					
Ever married	27 (29.3)	3 (20.0)	12 (36.4)	6 (15.8)	4.52
Never married	65 (70.7)	12 (80.0)	21 (63.6)	32 (84.2)	
Education					
High school graduate	50 (54.3)	2 (13.3)	20 (60.6)	16 (42.1)	11.17**
Less than high school	42 (45.7)	13 (86.7)	13 (39.4)	22 (57.9)	
Housing					
Living with family	43 (46.7)	5 (33.3)	10 (30.3)	12 (31.6)	4.27
Recently homeless	32 (34.8)	3 (20.0)	20 (60.6)	16 (42.1)	10.35**
Work					
Recently worked	34 (37.0)	4 (26.7)	7 (21.2)	12 (31.6)	3.00
Currently working	12 (13.0)	3 (20.0)	1 (3.0)	3 (7.9)	4.73
Health					
Chronic medical problems	33 (35.9)	8 (53.3)	12 (36.4)	16 (42.1)	1.92
Prescribed medications for physical problem	21 (22.8)	3 (20.0)	8 (24.2)	6 (15.8)	0.95

*$p < .05$; **$p < .01$.

severity are summarized in Tables 3 and 4. There was a complex interaction between psychiatric diagnosis and CD/ASPD, in which clients with schizoaffective disorder were more likely to have Adult ASPD Only, and clients with bipolar disorder were more likely to have Adult ASPD Only or Full ASPD than No CD/ASPD or CD Only.

With respect to substance use diagnoses, the Full ASPD group had the highest rate of recent (52.6%) and lifetime (73.7%) cannabis use disorder, while the Adult ASPD Only group had the highest rate of any recent drug use disorder (93.9%), recent cocaine use disorder (78.8%), and lifetime polysubstance use disorder (63.6%). While the specific rankings of drug use disorders tended to vary between the CD Only, Adult ASPD Only, and Full ASPD groups, clients with No CD/ASPD were least likely to have either a recent or lifetime drug use diagnosis in 12 out of 14 comparisons, with the exception of recent and lifetime other drug use disorders. Comparisons of the groups on substance use severity indicated significant differences between the groups in days of drug use over the past 6 months on the TLFB, ASI Drug Se-

Table 2. Demographic and Background Characteristics: Continuous Variables

	No CD/ASPD		CD Only		Adult ASPD Only		Full ASPD		
Continuous Variables	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	Kruskal-Wallis (χ^2)
Age	92	37.07 (8.43)	15	36.33 (8.25)	33	37.21 (6.11)	38	35.82 (7.25)	1.48
Days in psychiatric hospital	91	15.79 (28.86)	14	29.14 (45.51)	33	11.52 (18.29)	38	16.66 (41.83)	2.16
Days in substance abuse treatment	92	2.47 (7.00)	15	3.07 (8.78)	33	1.21 (3.54)	38	3.03 (7.94)	0.63
Days of literal homelessness	91	20.55 (57.03)	15	5.73 (18.76)	32	29.72 (53.08)	38	24.39 (66.27)	10.97**
Days of marginal homelessness	92	13.58 (39.33)	15	2.73 (7.51)	33	46.97 (92.44)	38	27.76 (56.64)	6.83
Monthly income	78	724.50 (481.54)	13	817.69 (250.11)	24	716.42 (238.02)	35	629.14 (280.25)	3.54

**$p < .01$.

Table 3. Psychiatric and Substance Use Diagnoses

Categorical Variables	No CD/ASPD (N = 92) n (%)	CD Only (N = 15) n (%)	Adult ASPD Only (N = 33) n (%)	Full ASPD (N = 38) n (%)	χ^2 Test
Psychiatric Diagnosis					
Schizophrenia	59 (64.1)	9 (60.0)	11 (33.3)	20 (52.6)	12.44*[a]
Schizoaffective	16 (17.4)	4 (26.7)	14 (42.4)	7 (18.4)	
Bipolar disorder	13 (14.1)	2 (13.3)	7 (21.2)	8 (21.1)	
Psychotic disorder NOS[a]	4 (4.3)	—	1 (3.0)	1 (2.6%)	
Delusional disorder[a]	—	—	—	1 (2.6%)	
Other psychotic disorder[a]	—	—	—	1 (2.6%)	
Substance Use Diagnosis					
Recent					
Alcohol	64 (69.6)	11 (73.3)	18 (54.5)	27 (71.1)	3.15
Any drug	63 (68.5)	13 (86.7)	31 (93.9)	30 (78.9)	9.98**
Cannabis	23 (25.0)	6 (40.0)	13 (39.4)	20 (52.6)	9.70*
Cocaine	49 (53.3)	11 (73.3)	26 (78.8)	23 (60.5)	7.68*
Narcotics	5 (5.4)	0 (0)	2 (6.1)	1 (2.6)	1.39
Polysubstance	13 (14.1)	2 (13.3)	7 (21.2)	9 (23.7)	2.23
Other	8 (8.7)	0 (0)	1 (3.0)	2 (5.3)	2.61
Lifetime					
Alcohol	77 (83.7)	13 (86.7)	25 (75.8)	33 (86.8)	1.81
Any drug	73 (79.3)	13 (86.7)	32 (97.0)	34 (89.5)	6.77
Cannabis	39 (42.4)	9 (60.0)	24 (72.7)	28 (73.7)	15.59***+
Cocaine	57 (62.0)	11 (73.3)	28 (84.8)	28 (73.7)	6.57
Narcotics	9 (9.8)	3 (20.0)	9 (27.3)	7 (18.4)	6.19
Polysubstance	30 (32.6)	8 (53.3)	21 (63.6)	23 (60.5)	14.32**
Other	16 (17.4)	3 (20.0)	5 (15.2)	14 (36.8)	7.06

[a]Diagnosis was not entered into the chi-square analysis.
*$p < .05$; **$p < .01$; ***$p < .001$.
+Meets Bonferroni correction for multiple statistical tests at $p < .05$ level.

verity, and DUS ratings, with the Adult ASPD Only group highest, followed by the Full ASPD group. Tukey Honestly Significantly Different (HSD) tests indicated that the Adult ASPD Only group had significantly higher DUS and ASI Drug severity ratings, and marginally significantly (p = .053) more days of drug use on the TLFB, than the No CD/ASPD group.

ANOVAs comparing the 4 CD/ASPD groups on the BPRS subscales and the GAS yielded no significant differences.

Criminal Justice System Involvement

Differences between the CD/ASPD groups in history of criminal charges and convictions, and time spent in jails or prison, are summarized in Table 5. Across most of the criminal justice variables there were significant differences between the 4 groups. These differences were most prominent for incarceration, lifetime charges, and charges and convictions for violent offenses, for which the Full ASPD group had the strongest history of offenses.

Differences between the CD/ASPD groups with respect to specific crime types are depicted in Figure 1. Chi-square analyses indicated significant differences between the groups on 5 specific categories of offense, including assault ($\chi^2 = 17.41$, df = 3, N = 174, p = .001), robbery ($\chi^2 = 16.25$, df = 3, N = 174, p = .001), weapons offense ($\chi^2 = 11.78$, df = 3, N = 173, p = .008), driving while intoxicated ($\chi^2 = 10.56$, df = 3, N = 174, p = .014), and major driving violation ($\chi^2 = 8.78$, df = 3, N = 174, p = .032). Similar to the measures of involvement in the criminal justice system, clients with Full ASPD were more likely to have been charged with these specific criminal offenses.

High-Risk Behavior

ANOVAs comparing the 4 CD/ASPD groups on 3 sexual-risk behaviors indicated a significant effect for lifetime number of sexual partners, F (3,146) = 2.96, p = .035, but a nonsignificant effect for lifetime sexual risk, F (3,107) = 1.16, ns. The number of partners of persons with Adult ASPD Only was the highest (M = 63.16, SD = 146.68), followed by Full ASPD (M = 31.42, SD = 87.66), followed by CD Only (M = 19.08, SD = 26.98) and No CD/ASPD (M = 12.85, SD = 21.36). This group effect was also significant when tested with the nonparametric Kruskal-Wallis test, ($\chi^2 = 9.23$, df = 3, N = 150, p = .025). Tukey HSD tests indicated that clients in the

Table 4. Substance Abuse Severity

Continuous Variables	No CD/ASPD N	No CD/ASPD Mean (SD)	CD Only N	CD Only Mean (SD)	Adult ASPD Only N	Adult ASPD Only Mean (SD)	Full ASPD N	Full ASPD Mean (SD)	ANOVA F
Timeline Follow-Back Alcohol	63	30.62 (32.41)	11	37.27 (40.21)	16	35.19 (41.75)	26	26.12 (32.70)	.37
Timeline Follow-Back Drugs	62	25.53 (30.86)	13	19.69 (29.59)	29	44.48 (37.80)	30	28.83 (32.25)	2.73*
ASI Severity—Alcohol	61	.18 (.17)	11	.28 (.26)	17	.24 (.18)	26	.19 (.19)	1.19
ASI Severity—Drugs	64	.10 (.08)	13	.11 (.10)	30	.16 (.09)	30	.11 (.09)	3.57*
Alcohol Use Scale—Reviewers	64	3.16 (1.03)	11	3.73 (1.19)	18	3.44 (.98)	26	3.23 (1.03)	1.17
Drug Use Scale—Reviewers	65	3.29 (.94)	13	3.31 (1.18)	31	3.9 (.94)	30	3.7 (.69)	2.87*
Substance Abuse Treatment Scale—Reviewers	90	2.89 (1.52)	15	3.13 (1.60)	32	2.69 (1.03)	37	2.68 (.85)	.61

*$p < .05$.

Adult ASPD Only group had significantly more sexual partners over their lifetime than clients in the No CD/ASPD group, whereas the other groups did not differ.

Discussion

Among these clients with severe mental illnesses and substance use disorders, substance abuse history and severity were inconsistently related to CD and ASPD, although evidence suggested that the Adult ASPD Only and Full ASPD groups had the most severe problems. For example, when examining which differences in substance use disorder and severity were significant across the 4 ASPD groups (Tables 3 and 4), the Adult ASPD Only group had the highest rate of lifetime polysubstance abuse disorder and any recent drug and cocaine diagnoses. Among clients with a drug use disorder, those in the Adult ASPD Only group had more days of drug use over the past 6 months on the TLFB and higher severity ratings of drug abuse on the interviewer ratings of ASI-Severity and the reviewer ratings on the DUS. The only 2 substance abuse variables that were significantly different between the groups on which the Adult ASPD Only group was not highest were lifetime and recent cannabis use disorder, for which the Full ASPD group was highest.

The association between ASPD and more severe substance use problems is consistent with prior research linking either Full ASPD or Adult ASPD Only to higher rates of substance use disorders in persons with severe mental illness[21–25] and more severe substance abuse among persons with dual disorders.[27] However, for most of the drug variables the Adult ASPD Only group had higher rates of drug diagnoses and more severe abuse problems than the

Table 5. Involvement with the Criminal Justice System

	No ASPD/CD (N = 92)	CD Only (N = 15)	Adult ASPD Only (N = 33)	Full ASPD (N = 38)	Statistic
Categorical Variables	n (%)	n (%)	n (%)	n (%)	Chi-Square Test
Ever convicted	41 (44.6%)	9 (60.0%)	21 (63.6%)	29 (76.3%)	χ^2 (3, 171) = 10.46*
Ever incarcerated	38 (41.3%)	8 (53.3%)	22 (66.7%)	30 (78.9%)	χ^2 (3, 173) = 16.6***+
Ever charged	62 (67.4%)	12 (80.0%)	27 (81.8%)	33 (86.8%)	χ^2 (3, 174) = 7.01
Violent offenses	19 (20.7%)	4 (26.7%)	10 (30.3%)	26 (68.4%)	χ^2 (3, 174) = 27.05***+
Nonviolent offenses	57 (62.0%)	12 (80.0%)	27 (81.8%)	31 (81.6%)	χ^2 (3, 174) = 8.93*
Misdemeanors	34 (37.0%)	6 (40.0%)	18 (54.5%)	26 (68.4%)	χ^2 (3, 174) = 11.13*
In jail over past year	23 (25.0%)	4 (26.7%)	9 (27.3%)	13 (34.2%)	χ^2 (3, 176) = 1.14
Continuous Variables	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Kruskal-Wallis
Lifetime convictions	1.45 (3.97)	1.86 (2.32)	2.06 (3.11)	6.42 (11.45)	χ^2 (3, 171) = 15.60*
Lifetime months incarcerated	4.64 (12.80)	18.14 (35.64)	11.75 (28.95)	31.84 (41.62)	χ^2 (3, 173) = 24.39***+
Lifetime charges	2.50 (4.10)	4 (5.23)	5.06 (5.07)	10.11 (11.69)	χ^2 (3, 174) = 24.55***+
Violent offenses	.33 (.82)	.50 (.94)	.62 (1.26)	2.16 (3.74)	χ^2 (3, 174) = 30.13***+
Nonviolent offenses	2.17 (3.90)	3.50 (5.06)	4.44 (4.86)	7.95 (9.52)	χ^2 (3, 174) = 20.43***+
Misdemeanors	1.97 (6.54)	.93 (1.27)	1.59 (2.49)	4.39 (8.44)	χ^2 (3, 174) = 10.78*
Days in jail over past year	11.28 (31.83)	20.36 (58.79)	4.25 (12.77)	30.66 (73.69)	χ^2 (3, 176) = 1.49

*$p < .05$; ***$p < .001$.
+Meets Bonferroni correction for multiple statistical tests at $p < .05$ level.

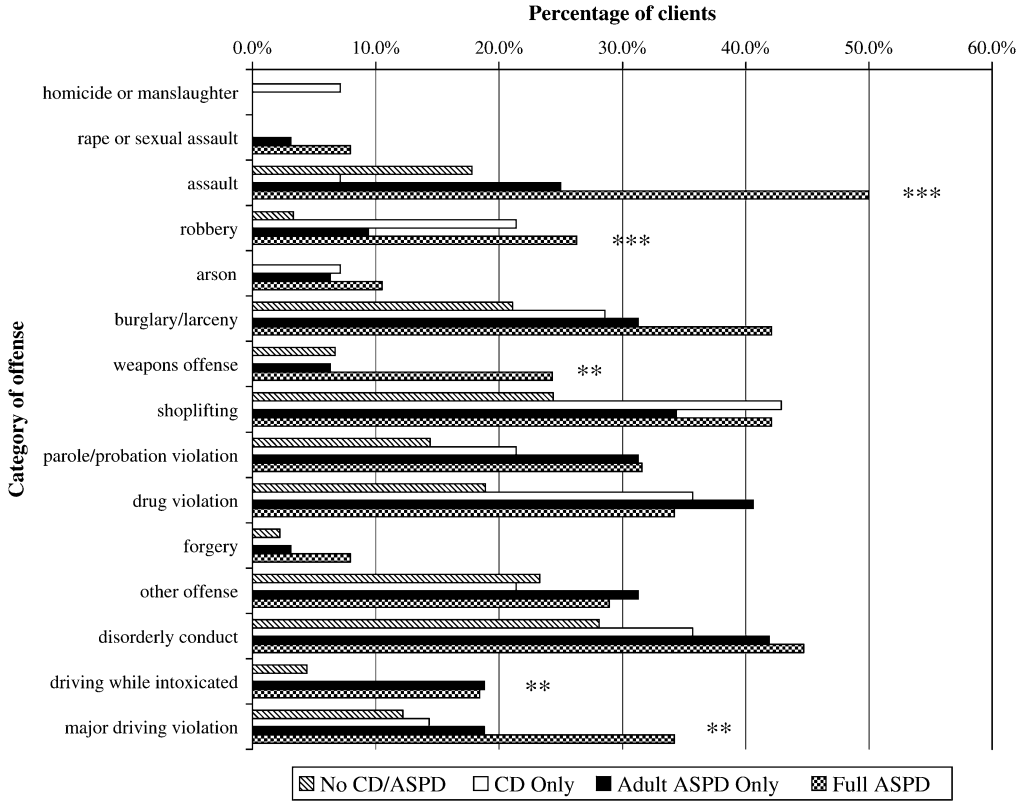

Fig. 1. Criminal Charges Against Clients in the 4 CD/ASPD Groups. The categories of homicide, sexual assault, arson, and forgery have too few participants per cell to carry out statistical analyses.

Full ASPD group. It is well established that severe addiction can lead to an antisocial lifestyle,[44–46] and Cottler et al.[47] have suggested that these clients may represent a late-onset subgroup of antisocial personality. The fact that the clients studied here with Adult ASPD Only were quite similar to those with Full ASPD with respect to their substance abuse is consistent with this hypothesis.

Similar to substance abuse, recent homelessness was also related to ASPD, with the Full ASPD and Adult ASPD groups most likely to have been homeless. In clients with dual disorders, homelessness appears to be a by-product of an antisocial lifestyle. Desai, Lam, and Rosenheck[48] have reported high rates of childhood conduct disorder in homeless people with severe mental illness (although ASPD was not investigated), which were uniquely predictive of recent criminal justice involvement, and they suggested that antisocial behavior frequently associated with conduct disorder may explain the high rates of arrest in this population.[49–51] The present findings suggest that homelessness may be associated with an antisocial lifestyle, even in the absence of a history of CD.

In addition to the high rates of homelessness and the severity of drug abuse in the Adult ASPD Only group, these clients differed from the other 3 groups in several respects. First, the Adult ASPD Only group consisted of more females (39.4%) than the other 3 groups, a difference most apparent with the Full ASPD group (10.5% women). Second, the Adult ASPD Only clients were the most likely of the 4 groups to have graduated high school, whereas clients with a history of CD (CD Only or Full ASPD) were the least likely. Other research has shown that CD interferes with educational achievement in childhood,[52,53] suggesting that the higher educational level of the Adult ASPD Only group may be due to the absence of CD rather than, or in addition to, a later onset of substance abuse. Third, the Adult ASPD Only group had the highest rate of schizoaffective disorder (42.4%), compared to between 17.4% and 26.7% for the other 3 groups. Finally, the Adult ASPD Only group had the highest rate of sexual risk behavior as reflected by the most lifetime sexual partners (63 lifetime partners), although the average number of partners for persons with Full ASPD (31 partners) or CD Only (27 partners) was also quite high compared with No CD/ASPD (13 partners).

The high level of educational attainment for the Adult ASPD Only group suggests that these individuals may have had a later age of the onset of their substance use problems, as prior research both in the primary addiction population[4,7,54] and persons with dual disorders[27] has shown that persons with CD Only and Full ASPD tend to have both earlier age of onset of substance use problems and lower levels of educational attainment. This pattern is also consistent with the interpretation that the antisocial behavior in this group is at least partly

(if not largely) secondary to substance abuse and dependence. The greater preponderance of women and schizoaffective disorder in the Adult ASPD Only group suggests that these characteristics may increase vulnerability to developing a substance-induced, late onset pattern of antisocial behavior, although the impact of substance abuse on affective symptoms cannot be ruled out.

The high number of sexual partners in the Adult ASPD Only group is also consistent with the antisocial behavioral lifestyle often present in persons with an addiction. Among individuals with severe mental illness, addiction is associated with an increase in a variety of risk behaviors, with multiple sexual partners being the most common.[55–57] A number of factors may contribute to the high rate of sexual partners in both the Adult ASPD Only group and the Full ASPD group. Substance abuse can lower inhibitions and increase impulsive behavior, leading to very informal sexual liaisons, and drug dependency can lead to trading sex for drugs or money, especially for women. Furthermore, temperament characteristics related to antisocial personality disorder or psychopathy, such as sensation seeking and monotony avoidance,[58–60] may also contribute to the predilection for multiple sexual partners among the individuals with CD Only and Full ASPD.

While the Adult ASPD Only group is noteworthy for its high rate of drug abuse severity, homelessness, and sexual risk behavior, frequently exceeding rates in the Full ASPD group, clients with Full ASPD differed markedly in their involvement in the criminal justice system, especially with respect to violent crime. The Full ASPD group had the most charges and convictions and had spent the most time in jail over the past year, as well as the most time incarcerated over their lifetime (see Table 5). As summarized in Figure 1, clients with Full ASPD were most likely to be charged with virtually every crime, especially assault, for which the rate was twice as high in the Full ASPD group (50%) as the Adult ASPD Only group (25%), and even lower for the other 2 groups. The strong association between Full ASPD and criminal behavior in this study is consistent with other reports linking ASPD to criminal behavior and violence in persons with schizophrenia and other severe psychiatric disorders.[24,27,30,61,62] The higher rate of criminal justice involvement in clients with the Full ASPD group is also consistent with studies in the general addiction population that have shown higher rates of aggression and criminal involvement in people with the full ASPD syndrome compared with those with the ASPD behavior pattern in adulthood but no history of CD.[47,63]

The fact that both ASPD groups had high rates of drug abuse severity but that criminal justice involvement was much higher in the Full ASPD group suggests that the criminal activity of these clients was not chiefly the result of their substance use problems. Tengström and colleagues[62] have shown that ASPD in schizophrenia is related to criminal behavior after controlling for the effects of substance abuse, and Abram has shown the same[64] in the offender population. The findings are consistent with Hodgins and colleagues' hypothesis that problems in violence and criminality in schizophrenia can be partly attributed to a subgroup of individuals with ASPD who are "early starters," whose antisocial behavior predates the onset of their schizophrenia.[16,65] For these individuals, substance abuse may complicate their criminal tendencies but may not be the root cause of most of their involvement in the criminal justice system.

A related question concerns the potential contribution of age at onset of substance use problems. Fulwiler et al.[66] reported that the onset of substance abuse before age 15, which is strongly related to the presence of ASPD,[4–6,27] was a better predictor of violence than adult onset of substance abuse in clients with dual disorders. Fulwiler and Ruthazer[67] subsequently reported that among clients with severe mental illness, history of CD was more predictive of violence in adulthood than age at onset of substance abuse, but age at onset nevertheless predicted violence after controlling for CD. Thus, developing substance use problems at an earlier age may contribute to criminal behavior in clients with dual disorders independent of CD, although apparently to a lesser extent.

The findings from this study have potentially important clinical implications, although they should be interpreted with caution due to the focus on clients with very severe dual disorders. In recent years there has been an increase in efforts to divert individuals with mental illness, who often have co-occurring substance use disorders, away from the criminal justice system[68] and to prevent the reincarceration of individuals with dual disorders,[69] with mixed results.[70–72] A major tenet of jail diversion and recidivism prevention programs for persons with major psychiatric disorders has been the delivery of psychiatric and substance abuse treatment services thought to be critical to reducing involvement in the criminal justice system.[73,74] The present study suggests that substance abuse may have a limited contribution to criminal justice involvement for persons with dual disorders, and that effective diversion or prevention of reincarceration may require attention to the constellation of attributes that define the ASPD syndrome. The findings also have implications for risk management of criminal behavior in community treatment settings that serve clients with severe mental illness, irrespective of their substance use problems, and point to the potential importance of focusing treatment efforts on the cognitive and behavioral characteristics of ASPD. For example, recent work with offender populations has focused attention on cognitive-behavioral interventions that address beliefs and attitudes thought to underlie criminal behavior (ie, "criminogenic" thinking patterns, such as the belief that others or society "owes" the person in some way), with some positive effects reported.[75,76] The ultimate

success of jail diversion and recidivism prevention programs may hinge not only on effective treatment of mental illness and substance use problems but also on addressing the ASPD syndrome that is overrepresented in this population.

Several limitations of the present study should be noted. First, as the study sample was drawn from 2 clinical settings, the observed rates of CD and ASPD may be higher than if the sample had been drawn from the general population (eg, community), due to Berkson's bias,[77] and the findings may not generalize to the broader population of persons with dual disorders. Second, recall problems or socially desirable responding may cause people to not report CD or ASPD symptoms, resulting in the underclassification of clients in the CD Only, Adult ASPD Only, and Full ASPD groups. Third, we did not obtain information about the age on onset of substance use disorder, precluding our ability to evaluate whether the Adult ASPD Only group had a later age of onset of substance abuse than the Full ASPD group.

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